

ABSTRACTS

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Raccoon Tracks Identification Guide: Applying Animal Tracking Skills to Detect Invasive Exotic Species

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The raccoon (*Procyon lotor*) is listed as invasive exotic species (Official State Gazette No. 298 of 12 December 2011). Introduced through pet trade, the raccoon constitutes a potential threat to native biodiversity and human health (Beltrán-Beck *et al.* 2012). The species has already been established in the centre of the Iberian Peninsula and some individuals have been sighted in other regions, including the Balearic and Canary Islands (García *et al.* 2011). Pet owners release the animal into the wild when it grows up and becomes aggressive and annoying. Although the sale of raccoons is now prohibited, some people still keep the animal at home.

Royal Decree 1628/2011, of 14 November, regulating the Spanish list and catalogue of invasive alien species, establishes the set up of an early warning system for detecting and monitoring non-indigenous potential invasive species. The eradication is only possible in the early stages of invasion.

Direct observation of carnivores, elusives and actives at night, is rare. Tracking is an economical and effective detection method (Virgós 2001). It doesn't require equipment (scent station, track-plate or camera trap), only training (Jeffress *et al.* 2011).

Raccoon detectability is high, even at low density of individuals. The raccoon lives in riversides close to urban areas (escaped from or released into the wild by pet owners) and footprints are well-defined in wet terrain —raccoons are heavy animals. In addition, raccoons deposit and accumulate the scats in prominent sites, and don't hide the remains of preys. The footprint is unmistakable, only in adverse substrates —dry terrain, coarse sand—, because of erosion —wind, rain— or inexperience of the observer might be confused with those of otter (*Lutra lutra*), badger (*Meles meles*), or coatí (*Nasua nasua*), introduced in Mallorca Island too. Scats can be easily confused with those of mustelids, fox (*Vulpes vulpes*), dog (*Canis familiaris*) or cat (*Felis* sp.).

Obtaining information about the current raccoon distribution and new introduction events would help to plan control and eradication actions, before raccoon population growth and range expansion affect native ecosystems. Early detection and rapid response system must be activated and citizen participation promoted.

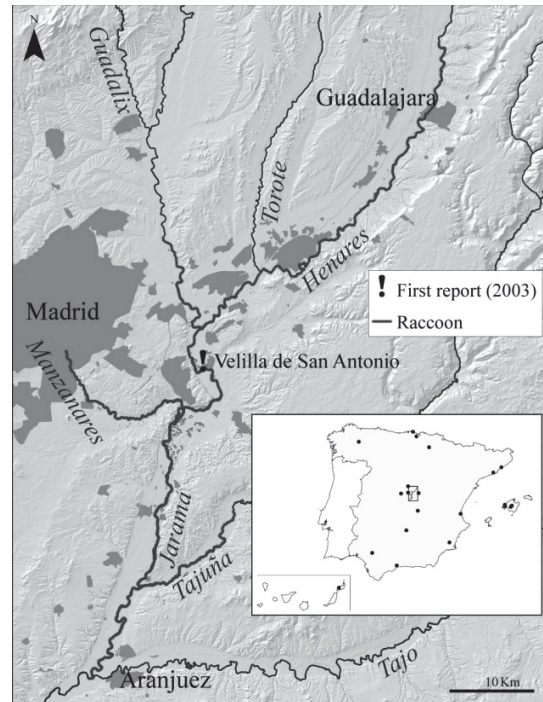


Figure 1. Distribution of *Procyon lotor* in Spain

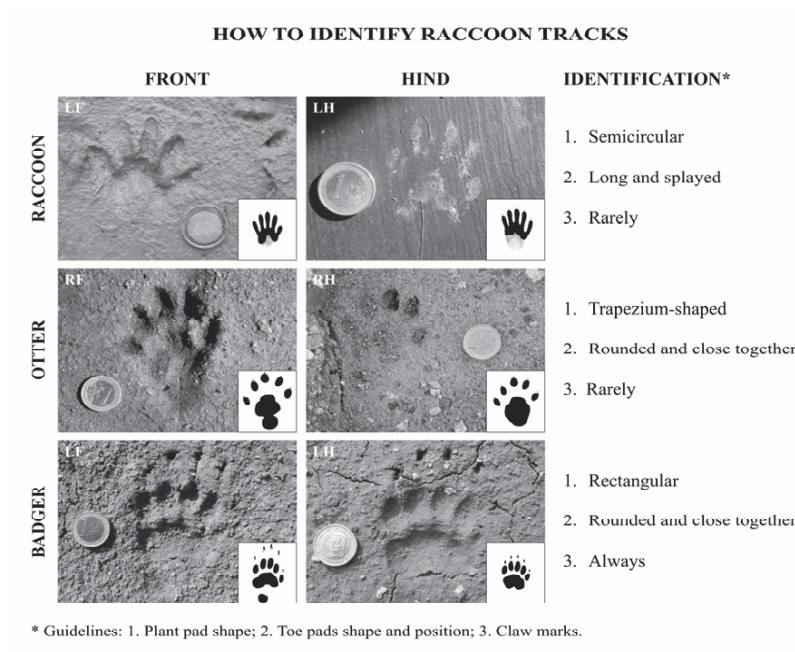


Figure 2. How to identify raccoon tracks

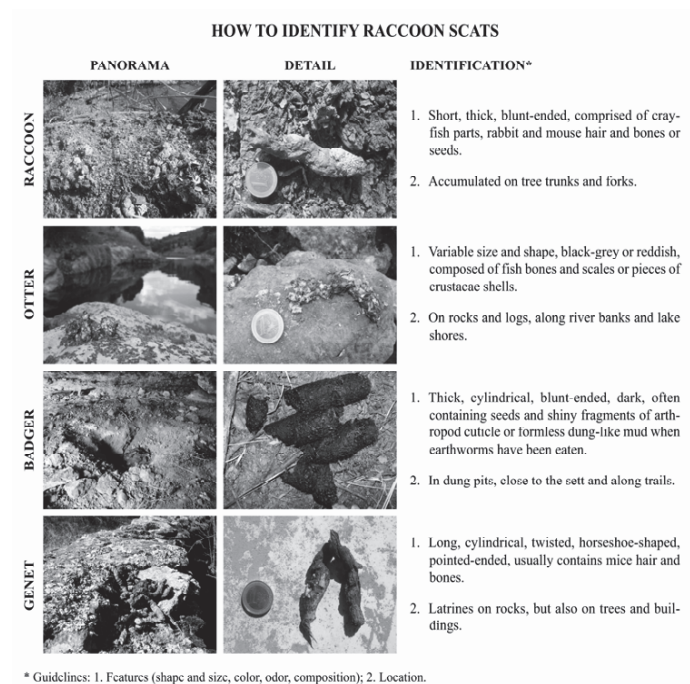


Figure 3. How to identify raccoon scats

References

- Beltrán-Beck B, García FJ, Gortázar C (2012) Raccoons in Europe: disease hazards due to the establishment of an invasive species. *European Journal of Wildlife Research* 58(1): 5-15.
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- Jeffress MR, Paukert CP, Sandercock BK, Gipson PS (2011) Factors affecting detectability of river otters during sign surveys. *The Journal of Wildlife Management* 75(1): 144-150.
- Virgós E (2001) Relative value of riparian woodlands in landscapes with different forest cover for the conservation of medium-sized Iberian carnivores. *Biodiversity and Conservation* 10(7): 1039-1049.

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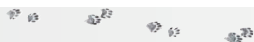
Return to the wild



The raccoon (*Procyon lotor*) is listed as invasive exotic species (Official State Gazette No. 298 of 12 December 2011). Introduced through pet trade, the raccoon constitutes a potential threat to native biodiversity and human health (Beltrán-Beck *et al.* 2012). The species has already been established in the centre of the Iberian Peninsula and some individuals have been sighted in other regions, including the Balearic and Canary Islands (García *et al.* 2011). Pet owners release the animal into the wild when it grows up and becomes aggressive and annoying. Although the sale of raccoons is now prohibited, some people still keep the animal at home.

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Find the invader



Direct observation of carnivores, elusives and actives at night, is rare. **Tracking is an economical and effective detection method** (Virgós 2001). It doesn't require equipment (scent station, track-plate or camera trap), only training (Jeffress *et al.* 2011).

How to identify raccoon tracks			
	Front	Hind	Identification*
Raccoon			<ol style="list-style-type: none"> 1. Semicircular. 2. Long, splayed. 3. Rarely.
Otter			<ol style="list-style-type: none"> 1. Trapezium-shaped. 2. Rounded, close together. 3. Rarely.
Badger			<ol style="list-style-type: none"> 1. Rectangular. 2. Rounded, close together. 3. Always.
* Guidelines: 1. Plant pad shape; 2. Toe pads shape and position; 3. Claw marks.			

How to identify raccoon scats			
	Panorama	Detail	Identification*
Raccoon			<ol style="list-style-type: none"> 1. Thick, blunt-ended, comprised of crayfish parts, rabbit and mouse hair and bones or seeds. 2. Latrines on tree trunks.
Otter			<ol style="list-style-type: none"> 1. Variable size, black-grey or reddish, composed of fish scales and bones or pieces of crustaceae shells. 2. On rocks and logs.
Badger			<ol style="list-style-type: none"> 1. Thick, dark, often containing seeds and shiny fragments of arthropod cuticle or formless dung-like mud. 2. In dung pits.
Genet			<ol style="list-style-type: none"> 1. Long, cylindrical and twisted, horseshoe-shaped and pointed-ended, usually contains mice hair and bones. 2. Latrines on rocks.
* Guidelines: 1. Features (shape and size, colour, smell, composition); 2. Location.			

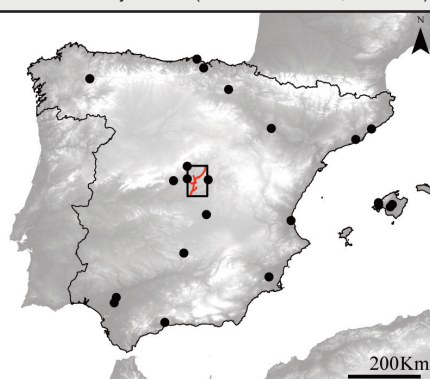
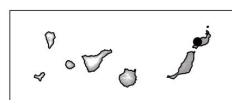
Prey remains	
<p>Like the Eurasian otter (<i>Lutra lutra</i>), the raccoon feeds on crayfish.</p> <p>Raccoons dig up the terrapin nests and eat the eggs, as foxes (<i>Vulpes vulpes</i>) and rats (<i>Rattus</i> sp.) do.</p>	

Where is the problem?

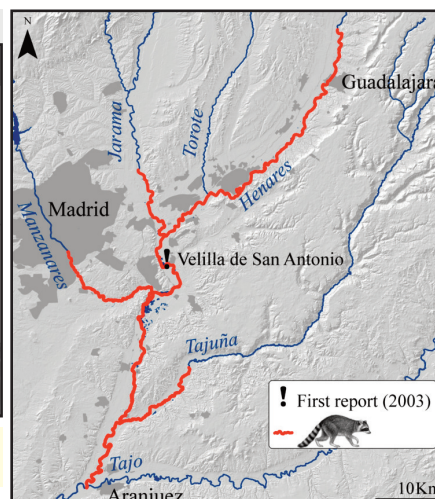
Obtaining **information about the current raccoon distribution and new introduction events** would help to plan control and eradication actions, before raccoon population growth and range expansion affect native ecosystems. **Early detection and rapid response system must be activated and citizen participation promoted.**

Raccoon distribution in the Iberian Peninsula and the Balearic and Canary Islands (García *et al.* 2011; own data)

Sightings of solitary individuals in the vicinity of cities are on the rise: **where has the raccoon established?**



The raccoon population expands along the riverbanks, in the provinces of Madrid and Guadalajara: **distribution limits should be defined and control actions implemented.**



References

- Beltrán-Beck B, García FJ & Gortázar C (2012) Raccoons in Europe: disease hazards due to the establishment of an invasive species. *European Journal of Wildlife Research* 58(1): 5-15.
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- Virgós E (2001) Relative value of riparian woodlands in landscapes with different forest cover for the conservation of medium-sized Iberian carnivores. *Biodiversity and Conservation* 10(7): 1039-1049.